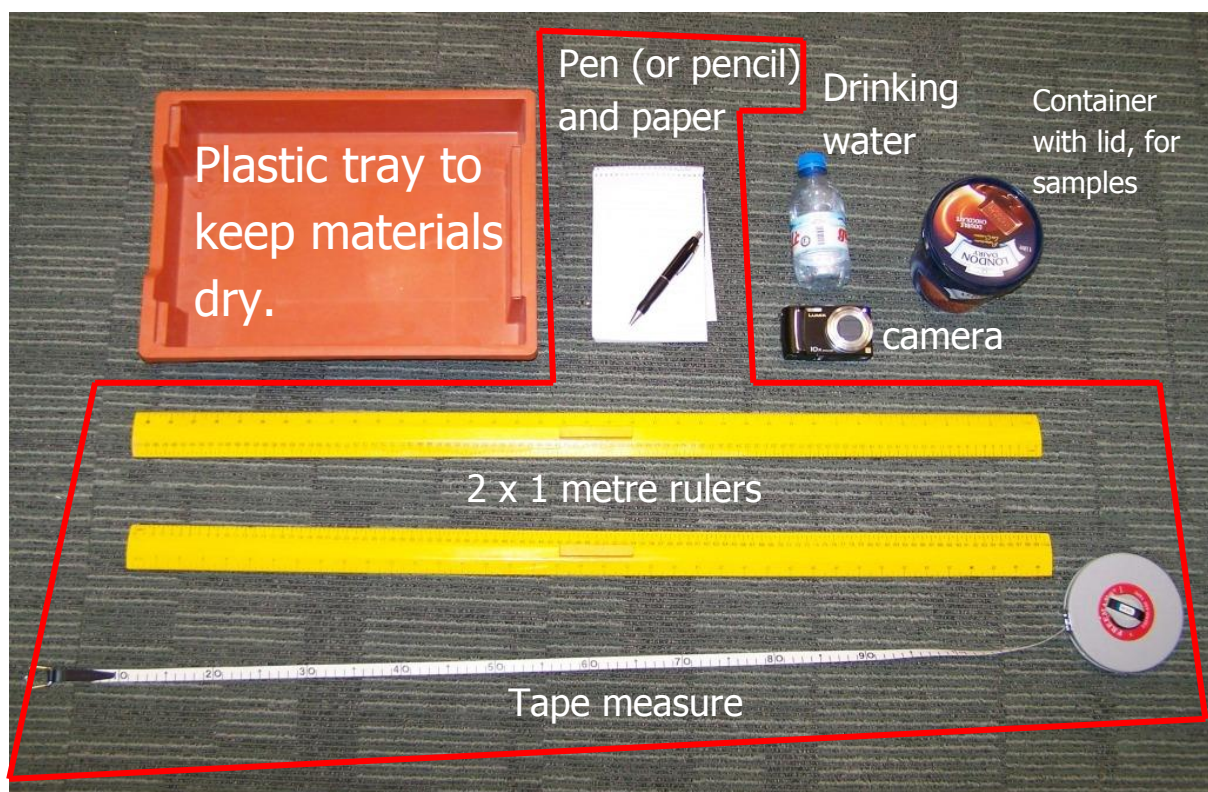


**This material supports Grade 11 advanced biology Curriculum Standard 16**

**Field work at Al Wakra beach:**

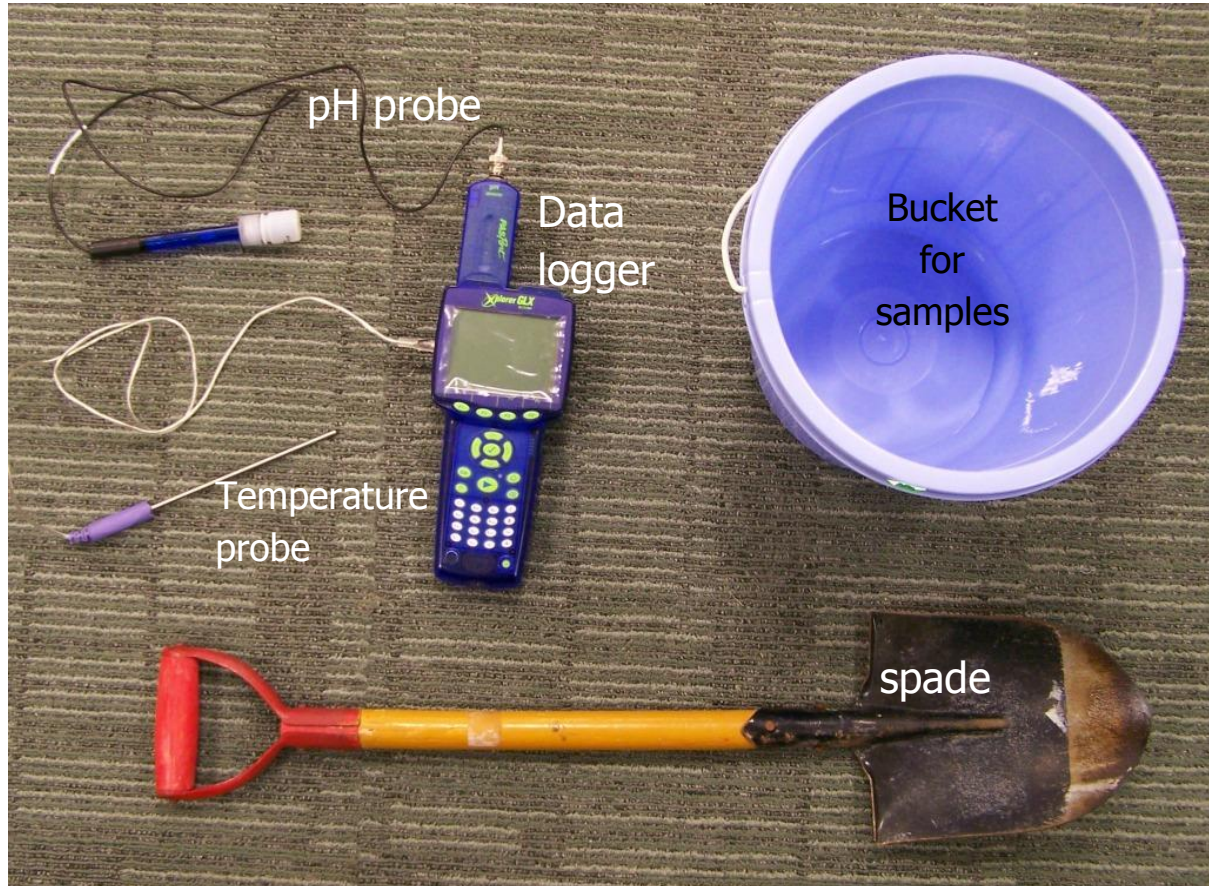
- Groups should consist of 2 or 3 students.
- Two students can successfully carry out the measurements, and a third person may record data.

Each group should have the following materials (essential items outlined in red)



**Additional materials:**

Towel, water for washing,





### **Habitats at Al Wakra beach:**

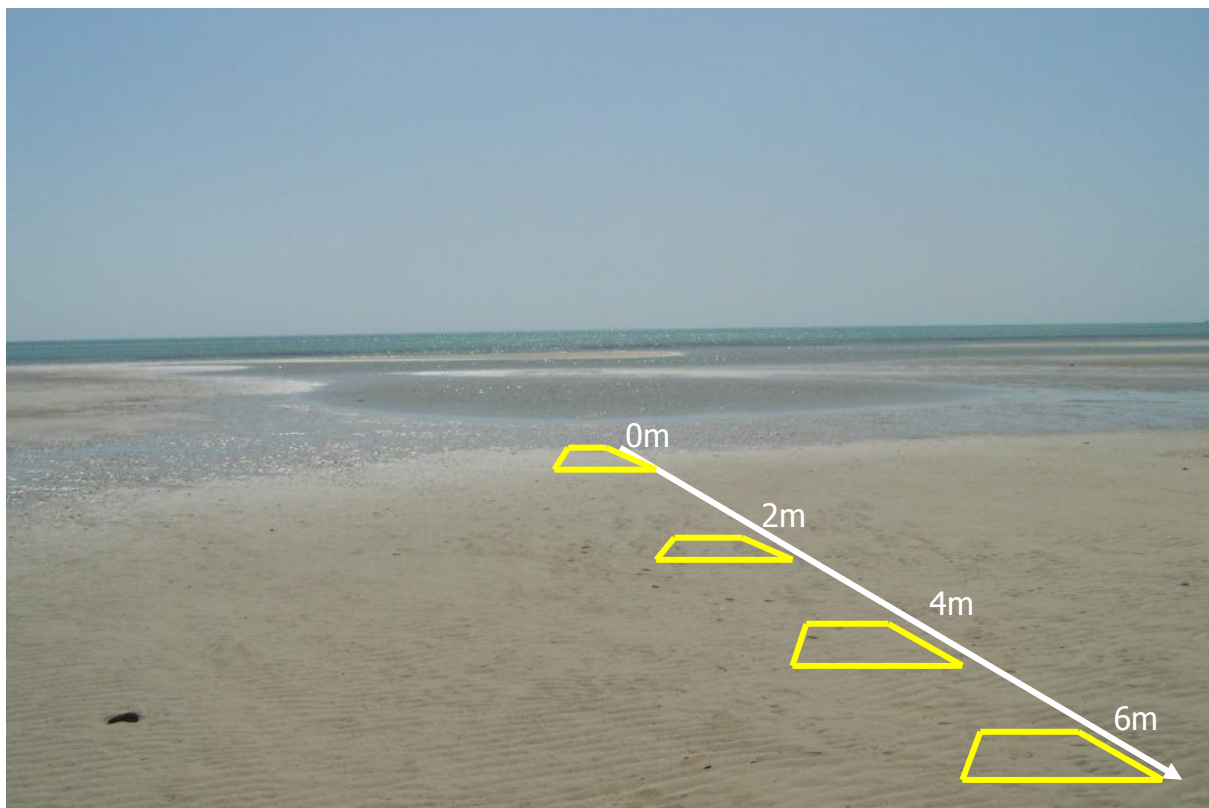
The shore consists of a sandy beach, with an associated rocky area.

### **Sandy shore:**

A transect can run from the edge of the water up the beach, or from the high tide mark down the beach.

Because the beach is not level, it is important to estimate the vertical height of the shore since organisms are distributed according to the length of time the shore is uncovered by water.

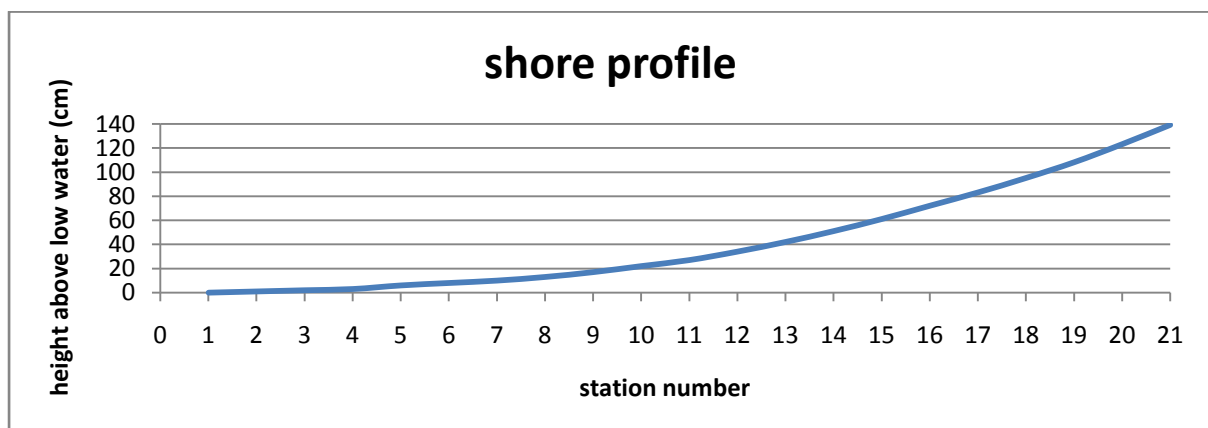
Quadrats may be placed at 2 metre intervals (for example) along a transect to show how the population of one organism changes with vertical height from the water's edge.



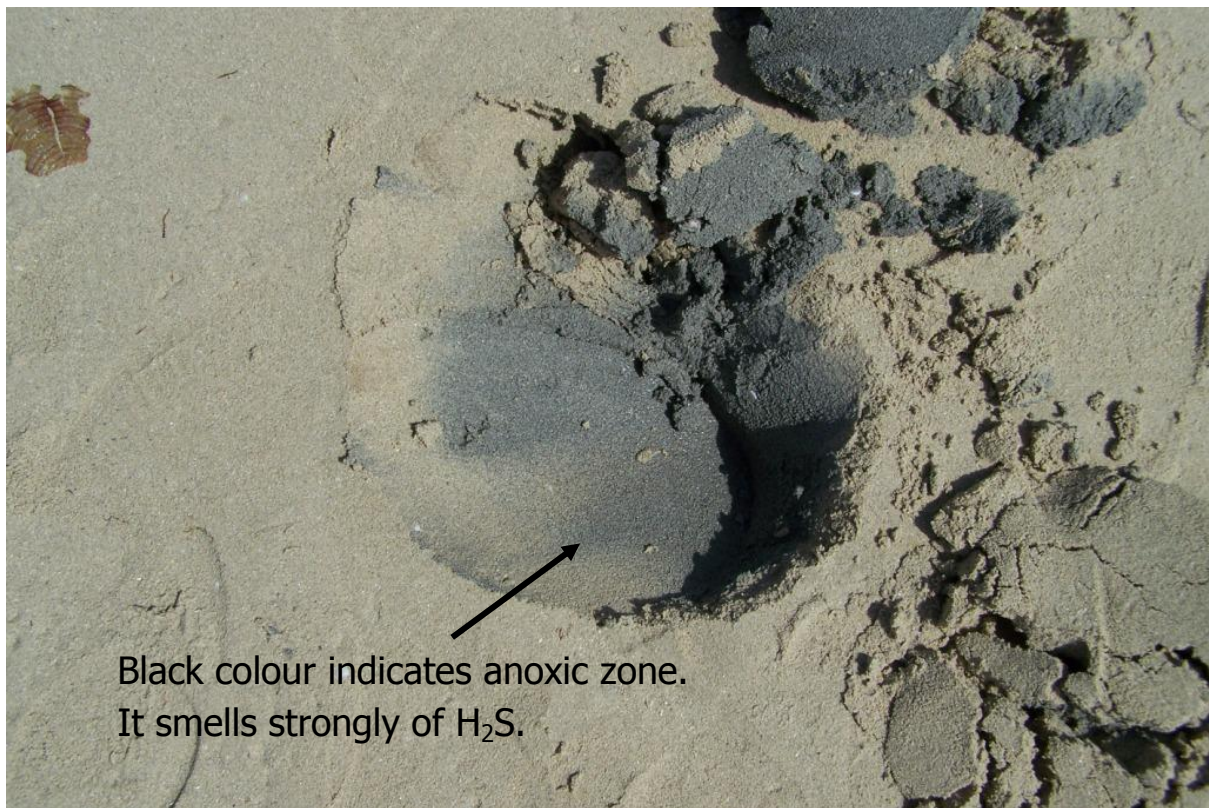
### An example of shore profile data:

| Station number | Horizontal distance from water's edge at low tide (m) | Height above previous station (cm) | Cumulative height (height above water's edge) (cm) |
|----------------|---|------------------------------------|--|
| 1              | 0   | 0                                  | 0  |
| 2              | 2   | 1                                  | 1  |
| 3              | 4   | 1                                  | 2  |
| 4              | 6   | 1                                  | 3  |
| 5              | 8   | 3                                  | 6  |
| 6              | 10  | 2                                  | 8  |
| 7              | 12  | 2                                  | 10   |
| 8              | 14  | 3                                  | 13   |
| 9              | 16  | 4                                  | 17   |
| 10             | 18  | 5                                  | 22   |
| 11             | 20  | 5                                  | 27   |
| 12             | 22  | 7                                  | 34   |
| 13             | 24  | 8                                  | 42   |
| 14             | 26  | 9                                  | 51   |
| 15             | 28  | 10                                 | 61   |
| 16             | 30  | 11                                 | 72   |
| 17             | 32  | 11                                 | 83   |
| 18             | 34  | 12                                 | 95   |
| 19             | 36  | 13                                 | 108  |
| 20             | 38  | 15                                 | 123  |
| 21             | 40  | 16                                 | 139  |

One way of presenting the data as a diagram:



Much of the substrate is anoxic close to the surface.

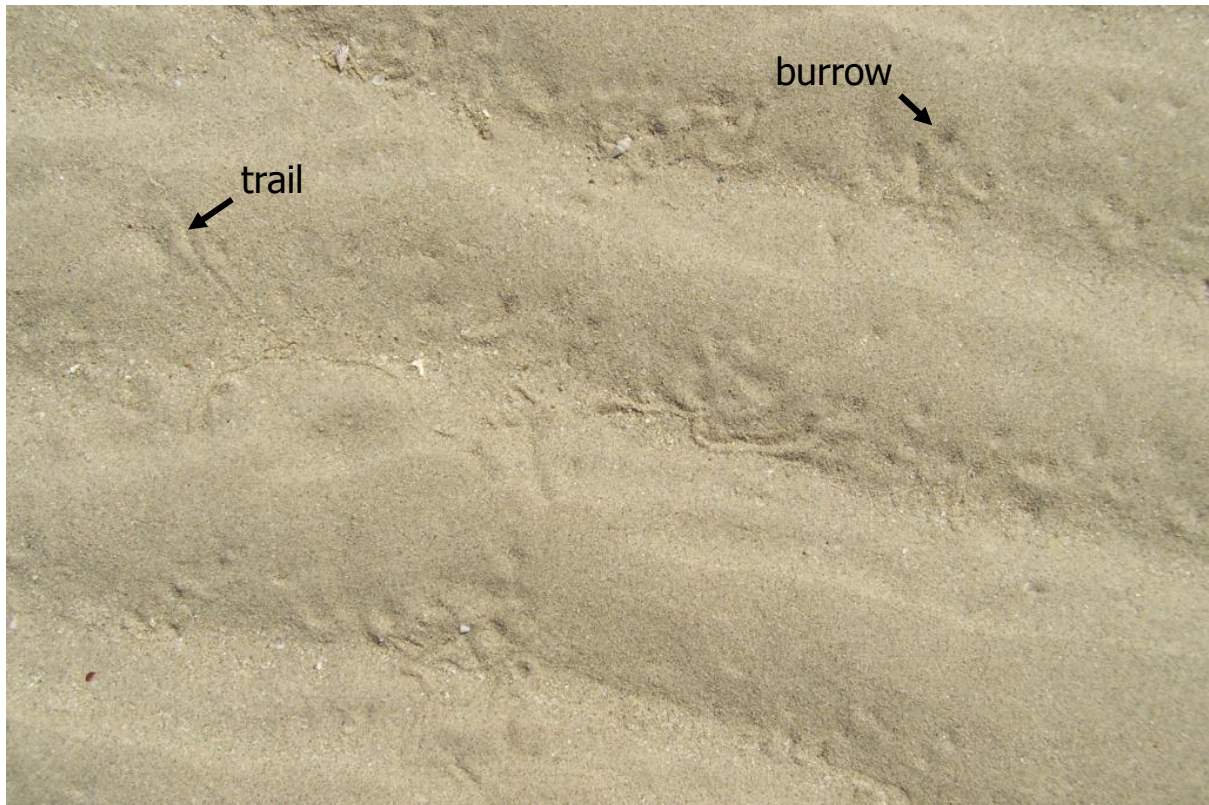


Students could investigate whether this anoxic zone has an influence on the distribution of organisms.

**Organisms** present include worms, snails and crabs.

**Worm burrows** are recognised by trails leading to each burrow.





**Crab burrows** are located further up the shore than worm burrows and are recognised by balls of sand around each burrow. The population can be counted directly.



Crab size may be estimated by burrow diameter.

The size of the sand balls varies and may indicate crab size, however it may also depend on the physical properties of the sand.



Elsewhere, there are congregations of snails. Their density is greater in areas which are more low-lying and therefore wetter.





### **Rocky shore:**

Numerous rock pools are present.

Organisms include barnacles, mussels, crabs, isopods, snails, algae (see slideshow).

Turning over rocks reveals amphipods.

### **Suggested investigations:**

Is there a relationship between height of rock pool above low water and distribution of organisms?

Preliminary investigation revealed that the temperatures of rock pools vary by 2 - 3°C.



The pH of rock pools was constant at 8.3.